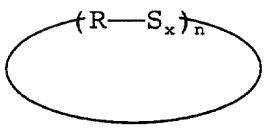
CLAIMS

1. A method for producing a cyclic polysulfide having the formula (I):



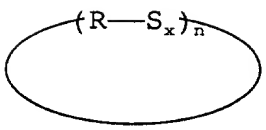
(I)

wherein x is an integer of 2 to 6, n is an integer of 1 to 15, and R indicates a substituted or unsubstituted C_2 to C_{18} alkylene group or a substituted or unsubstituted C_2 to C_{18} alkylene group containing an oxyalkylene group comprising:

reacting a dihalogen compound having the formula X-R-X, wherein X independently indicates a halogen atom, and R indicates a substituted or unsubstituted C_2 to C_{18} alkylene group or a substituted or unsubstituted C_2 to C_{18} alkylene group containing an oxyalkylene group and an alkali metal polysulfide having the formula M_2S_x, wherein M indicates an alkali metal and x is an integer of 2 to 6 by a two-phase system in a incompatible mixed solvent of a hydrophilic and lypophilic solvent.

2. A method for producing a cyclic polysulfide as claimed in claim 1, wherein comprising performing the reaction between the dihalogen compound and the alkali metal polysulfide in an incompatible mixed solvent system of 10 to 2000 parts by weight of hydrophilic and lypophilic solvents, respectively, based upon 100 parts by weight of the dihalogen compound at a temperature of 50 to 120°C.

3. A method for producing a cyclic polysulfide having the formula (I):



(I)

wherein x is an integer of 2 to 6, n is an integer of 1 to 15, and R indicates a substituted or unsubstituted C_2 - C_{18} alkylene group or a substituted or unsubstituted C_2 to C_{18} alkylene group containing an oxyalkylene group comprising:

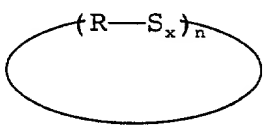
reacting a dihalogen compound having the formula X-R-X, wherein X independently indicates a halogen atom and R indicates a substituted or unsubstituted C_2 to C_{18} alkylene group or a substituted or unsubstituted C_2 - C_{18} alkylene group containing an alkylene group,

with a solution of an alkali metal polysulfide having the formula M_2S_x, wherein M indicates an alkali metal and x is an integer of 2 to 6, by adding the dihalogen compound at a rate such that the dihalogen compound reacts with the alkali metal polysulfide at the interface thereof.

4. A method for producing a cyclic polysulfide as claimed in claim 3, wherein the reaction at the interface is carried out at a temperature of 50 to 120°C.

5. A rubber vulcanization agent comprising a compound having the formula (I) produced by the method according to claim 1 or 3.

6. A rubber vulcanization agent comprising a cyclic polysulfide compound having the formula (II):



(II)

wherein x is an integer of 2 to 6, n is an integer of 1 to 15, and R indicates a substituted or unsubstituted C_2 to C_{18} alkylene group or a substituted or unsubstituted C_2

to C_{18} alkylene group containing an oxyalkylene group.

7. A rubber composition comprising 100 parts by weight of a diene-based rubber and 0.5 to 30 parts by weight of the rubber vulcanization agent according to claim 6.